

## SECTION 33 4000

### STORM DRAINAGE UTILITIES

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#### LANL MASTER SPECIFICATION

When editing to suit project, author shall add job-specific requirements and delete only those portions that in no way apply to the activity (e.g., a component that does not apply). To seek a variance from applicable requirements, contact the ESM Civil POC.

When assembling a specification package, include applicable specifications from all Divisions, especially Division 1, General Requirements.

Delete information within "stars" during editing.

Specification developed for ML-3 projects. For ML-1 / ML-2, additional requirements and QA reviews are required.

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#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Site storm drainage piping, fittings, and accessories beyond building wall.

##### 1.2 LANL PERFORMED WORK

- A. LANL's Support Services Subcontractor will inspect interior of storm drainage lines beyond the building wall with video camera for piping integrity and proper construction.

##### 1.3 SUBMITTALS

- A. Submit the following in accordance with Section 01 3300, Submittal Procedures:
  - 1. Catalog data on pipe materials, fittings and accessories.
  - 2. Installation instructions for accessories.
  - 3. Certifications of welders qualified for heat fusion polyethylene pipe joints.

##### 1.4 QUALITY ASSURANCE

- A. Welders Certifications and Qualified Procedure Standards
  - 1. Plastic Pipe: 49 CFR 192.283 and 192.285, and Driscopipe heat fusion qualification guide.

## PART 2 PRODUCTS

### 2.1 PRODUCT OPTIONS AND SUBSTITUTIONS

- A. Alternate products may be accepted; follow section 01630, Product Options and Substitutions.

### 2.2 STORM DRAINAGE PIPING

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Consult with a LANL Utilities Group representative for approval when selecting buried piping material.  
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- A. Ductile Iron Pipe: AWWA C151.
  - 1. Joints: Bell and spigot, AWWA C111 rubber gaskets.
  - 2. Fittings: AWWA C110, Ductile-Iron or Gray-Iron, Class 350 or AWWA C153, Ductile-Iron Compact Fittings, Class 350.
- B. PVC Pipe and Fittings: AASHTO M304 and ASTM D1784.
  - 1. Joints: Bell and spigot, ASTM D3212, rubber gaskets.
- C. Polyethylene Pipe and Fittings.
  - 1. Manufacturer: CP Chem Performance Pipe, [Driscoplex 4200, Iron Pipe Size] or [Driscoplex 4300, Ductile Iron Pipe Size].
  - 2. Material: High density polyethylene, ASTM D3350, AASHTO M294, PE3408, SDR 15.5 (working pressure rating of 110 psi at 73 degrees F), cell classification number PE 345464C.
  - 3. Joints: Heat fusion per manufacturer's instructions.

### 2.3 CORRUGATED METAL PIPE

- A. Material: Steel base metal with 2 oz. per square foot zinc coating per AASHTO M-218 and ASTM A444 or polymeric coating AASHTO M246 and ASTM A742.
- B. Fabrication: Fabrication by corrugating continuous coils into helical form with lock-seam or by rolling annular corrugated mill sheet per AASHTO M36 and ASTM A760; polymeric pipe per AASHTO M245.
- C. Gaskets and Sealants: ASTM D1056 sponge neoprene sleeve gaskets and mastic sealant.

## 2.4 CORRUGATED POLYETHYLENE PIPE AND FITTINGS

- A. Material: High density polyethylene, ASTM F405 and AASHTO M252 pipe and fittings size small, ASTM F667 and AASHTO M252 pipe and fitting size medium, and AASHTO M294 pipe and fitting size large, 12 inch and larger. Pipe shall have corrugated exterior with smooth interior.
- B. Gaskets and Sealants: ASTM D3212, flexible elastomeric seals.
- C. Installation: Per manufactures requirements and recommendations of ASTM D2321.

## 2.5 CLEANOUTS

- A. Manufacturer: J.R. Smith Mfg. Co.
- B. [Select cleanouts to suit project. Refer to manufacturer's catalog data for selection criteria.]

## 2.6 MANHOLES

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Refer to the Civil Standard Drawings ST-G3030-1 and ST-G3030-2 for catch basin details, and STG3030-3 for manhole detail.  
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- A. Provide concrete catch basins and pre-cast concrete manhole per details shown on the Drawings.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify excavations are to required grade. Do not over excavate.

### 3.2 PREPARATION

- A. Ream pipe ends, remove burrs, and regalanize damaged surfaces.

### 3.3 BURIED PIPING

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Tracer wire and test stations are required when specifying ductile iron, and non-metallic piping. Comply with Civil Standard Drawing ST-G30GEN-3 for tracer wire/test station details and Civil Standard Drawing ST-G30GEN-4 for trenching detail.  
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Refer to the Engineering Standards Manual, Civil Chapter, Section G30 for required minimum utility line clearances.  
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- A. Refer to Drawings and Section 31 2000, Earth Moving, for earth cover, bedding, tracer wire, wire continuity test, warning tape, documenting new or exposed existing utility location, etc requirements.
- B. Bedding material for corrugated metal pipes shall confirm to Drawings and Section 31 2000, Earth Moving. Place bedding material under the pipe and around a minimum of 1/3 the diameter of the pipe. Place bedding material to provide uniform support for the entire length of pipe.
- C. Backfill material for corrugated metal pipes shall consist of a well graded mixture of stone fragments, gravel, and sand. Backfill material shall have a maximum particle size less than 1.5 inches and be free of organic material, frozen clump, or stones.

### 3.4 INSTALLATION

- A. Encase exterior cleanouts in concrete, flush with gradient as shown on drawings.
- B. Route piping in orderly manner and maintain gradient as shown on drawings.
- C. Install bell and spigot pipe with bell end upstream.
- D. Sleeve and caulk pipes penetrating exterior walls below grade to provide a waterproof installation, "excluding corrugated type pipes."
- E. Pressure test piping system with water in accordance with Section 22 0813, excluding corrugated type pipes.

### 3.5 LANL ACCEPTANCE INSPECTION AND TESTING

- A. Notify LANL Construction Inspector at least 10 working days in advance to schedule inspection of piping system.
- B. LANL Construction Inspector will contact LANL Utilities Group representative to arrange for video inspection of interior of piping system beyond building wall. LANL's Support Services Subcontractor will perform inspection.

### END OF SECTION

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Do not delete the following reference information:

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### FOR LANL USE ONLY

This project specification is based on LANL Master Specification 33 4000 Rev. 0, dated January 6, 2006.